



MARSHALL STAR

Serving the Marshall Space Flight Center Community

April 4, 2002

Managing the Space Launch Initiative

Marshall Center testing new breed of auxiliary propulsion for Space Launch Initiative

by Amie Cotton

Engineers at the Marshall Center have begun a series of engine tests on a new breed of space propulsion: a Reaction Control Engine developed for the Space Launch Initiative – a technology development effort to establish reliable, affordable space access.

The engine, developed by TRW Space and Electronics of Redondo Beach, Calif., is an auxiliary propulsion engine designed to maneuver vehicles in orbit. It is used for docking, reentry, attitude control, and fine-pointing while the vehicle is in orbit.

The engine is unique because it uses non-toxic chemicals as propellants — a feature that creates a safer environment for ground operators, lowers cost and increases efficiency with less maintenance and quicker turn-around time between

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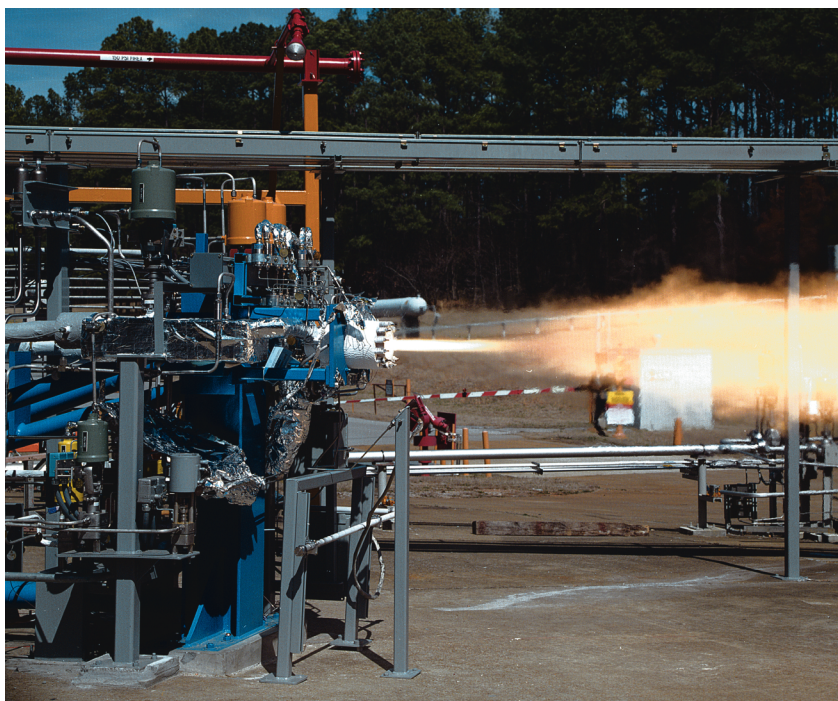


Photo by Dennis Olive, NASA-Marshall Space Flight Center

Reaction Control Engine, developed by TRW, undergoing testing at Marshall.

Record number of teams competing April 12-13

NASA's 9th annual Great Moonbuggy Race participants ready for showdown

Marshall news release

Students from across the United States and as far away as Puerto Rico and South America will come to Huntsville for the 9th annual Great Moonbuggy Race at the U.S. Space & Rocket Center, April 12-13.

Seventy-seven teams – representing high schools and colleges from 21 states, Puerto Rico and Colombia – will race

human powered vehicles over a lunar-like terrain. But the competition requires more than physical endurance because students must use a wide range of skills as a team to design, engineer and build their vehicle.

The Great Moonbuggy Race is inspired by development some 30 years ago of the lunar roving vehicle, a program managed by the Marshall Center. Engineers at that

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Multimedia showcase to present 'stunning' space images as part of 15th Annual Von Braun Forum

The Marshall Center is hosting a free multimedia show entitled "The Unseen Majesty of Science" at the Von Braun Center on Saturday.

The show is part of the Marshall's 15th Annual Von Braun Forum, an event recognizing the contributions of Dr. Wernher von Braun to the Tennessee Valley and the nation's space program.

Stunning space images on three 15-by-20-foot screens, space-themed original artwork, live music by guest soloists and the 60-member Metro Youth Orchestra, plus a sophisticated light show and pyrotechnics are part of the show.

"In February, we gave every 6th grader in five surrounding counties a study guide challenging them to discover how the habits of science — creativity, imagination, curiosity, patience, attention to detail and honesty — all come together in scientific discovery," said Shar Hendrick, manager of the Government and Community Relations Department at Marshall.

"Our point was that scientific discovery is a wonderfully creative process. The multimedia show takes the theme one step farther, conveying how the creative process for scientists is very similar to that of painters and musicians, inventors and explorers," Hendrick said.

Why is that important?

"We want our young people to stay excited about exploration and discovery," Hendrick said. "We're looking to help motivate our next generation of original thinkers. That's why the show is something to be experienced, to have fun with and be inspired by."

Tickets to the Saturday event, which begins at 7:30 p.m., are free but limited. Marshall team members may pick up tickets at the Von Braun Center box office or at the NASA Exchange Space Shop in Bldg. 4203. For more information, go to the "Unseen Majesty of Science" Web site, www.unseenmajesty.com

Get on board with E² TEAMS

Conference highlights workforce development and education

Marshall Media Relations Department

The Technological Excellence in Aviation, Missiles and Space (TEAMS)- Week 2002 comes to the Von Braun Center next week. The event highlights workforce development and education while bringing together several conferences — all in one week.

The Core Event of TEAMS week is E²TEAMS in which the "E" highlights education and employment as TEAMS focal points. The Marshall Center, U.S. Army Aviation and Missile Command, and U.S. Army Space and Missile Defense Command sponsor the conference in conjunction with the Huntsville Association of Technical Societies.

The event will feature sessions in education, technology and workforce development, and a special career night Tuesday, April 9, with a focus on civil servants who may retire soon. This session will provide an opportunity for those interested in starting a second career to meet with industry representatives.

Other sessions include: the American Institute of Aeronautics and Astronautics' Reusable Launch Vehicle Conference; the first Southeastern Software Engineering Conference; the Association of Unmanned Vehicle Systems International's Pathfinder 2002 conference; and an update on the Aviation Corridor of Excellence.

Art Stephenson, Marshall Center director, will be the keynote speaker for Thursday's opening session of the Reusable Launch Vehicle Conference. He'll discuss NASA's integrated space transportation plan during his presentation at 8:30 a.m.

"Technology Town" will showcase space, missiles, robotics, software, academics and workforce development exhibits. There will be several special luncheons, receptions and dinners during the week.

For a full conference agenda, visit the TEAMS 2002 Web site at: <http://www.hats.org/teams/index>.

Property awareness training mandatory

The Property Management Group is working to assist Marshall team members in understanding property management responsibilities.

Government property users have a public trust to protect and conserve government property and shall not use such property, nor allow its use, for other than authorized purposes.

Property awareness training is mandatory.

Additional information can be obtained in the Marshall Work Instruction MWI 4200.1 and the NASA Policy NPG 4200.1.

Designated property support assistants, and other property management help, can be found at the following Web sites: Property training - <http://eodd.msfc.nasa.gov/property/>

Property support assistants -<http://eodd.msfc.nasa.gov/property/property-support.pdf>

Organizational property managers - <http://srs.msfc.nasa.gov/catalog/includes/opmlist.htm>

Survey form - http://co.msfc.nasa.gov/ad40/cust_serv2.html



Photo by Emmett Given, Marshall Center

Silver Snoopy Awards

Receiving Silver Snoopy Awards from Expedition Three Commander Frank L. Culbertson Jr., from left, William Greene, Paul Patterson, Culbertson, Tracy Reynolds and Jason Elmore.



Photo by Terry Leibold, Marshall Space Flight Center

Receiving Silver Snoopy Awards from astronaut T.J. Creamer, from left, Keith Robinson, Laura Giardini, Creamer and Rita Brazier.



Emmett Given, Marshall Space Flight Center

Culbertson receives a memento of his visit from Marshall Director Art Stephenson.



Photo by Emmett Given, Marshall Center

While visiting Marshall, Expedition Three Commander Frank L. Culbertson Jr. talks from the Payload Operations Center to the Expedition Four crew onboard the Space Station. Culbertson spent 125 days onboard the Station.

Moonbuggy

Continued from page 1

time had to design a compact, lightweight "all-terrain vehicle" that could be transported to the moon in the small Apollo spacecraft. The Great Moonbuggy race challenges students to design and build a human-powered vehicle and in the process overcome engineering problems similar to those faced by the original Marshall Center team.

The students must design a vehicle that occupies a space no more than 4 feet by 4 feet before it is assembled prior to the race. During the race, two team members – one male and one female – power and drive each vehicle over a half-mile obstacle course of simulated moonscape terrain.

Winners in each category – high school and college – are determined by

the fastest vehicle assembly time, plus time through the course. An additional prize is awarded to the team with the best technical approach to solving the engineering problem of navigating the "lunar" surface.

"This is the greatest participation we've ever had for the races," said Jim Pruitt, manager of the Education Programs Department at Marshall. "We have teams that have participated for several years and we have new teams that will be here for the first time. We expect to see some innovative designs and fantastic competition."

The annual event is sponsored by several Huntsville organizations: the Marshall Center, the U.S. Space & Rocket Center, the American Institute of Aeronautics and Astronautics Alabama-Mississippi Section, the Aerospace Development Center of Alabama, Sci-Quest North Alabama Science Center and television

station WAFF.

The high school race is April 12 and the college race is April 13. Race times each day are 8:30 a.m. to 5:30 p.m.

NASA employees and family members will be admitted free. Contract employees must pay \$12 for adults and \$6 for students age 3-12. Visitors who accompany race teams will be charged \$5.

There is no charge for civil servant or contract employees who volunteer to help at the races.

For more information on ticket costs and race events, call Jim Brown at 721-7110 or Barbara Jackson at 722-5623 at the Space and Rocket Center.

Event details, a full listing of the competing teams, race rules, information on the course and photos from previous competitions are on the Web at <http://moonbuggy.msfc.nasa.gov>

Emergency Services at Marshall: What you need to know

from the Safety & Mission Assurance Office

The 911 system at Marshall operates seven days a week, 24 hours a day.

If you're using a cellular phone, tell the dispatcher that you're calling from Marshall Space Flight Center, and they will immediately connect you to the Center's 911 dispatcher.

Marshall 911 calls are answered by Security. The Redstone Fire and Emergency Services Department and Huntsville Medical Communication 911 Center also monitor calls. Marshall Medical Center and onsite HEMS personnel monitor calls as well between 7 a.m. and 5 p.m., Monday through Friday.

Never hang up until the dispatcher tells you to. You can do the most good by supplying information so emergency personnel can respond quickly with the correct equipment.

Let the dispatcher control the conversation. Be prepared to give the following answers:

- Nature of the Emergency
- Where is the Emergency Site - Use the emergency sticker on Marshall phones as a reminder of building and room numbers.
- Tell if someone other than yourself

can wait near the closest roadway to flag down the emergency vehicle.

- Tell the dispatcher if you can safely remain at that phone location. If not, after you've given the essential information, you'll be asked to go to a safe spot and call back.

Wait for emergency personnel to arrive. Marshall security officers respond to each 911 call, arriving in less than 4 minutes, except at locations by the river. The fire department arrives in 2 to 4 minutes, depending on how close the fire station is. If HEMS personnel are onsite, the ambulance arrives in 4 minutes or less; from downtown, the ambulance arrives in fewer than 12 minutes. The dispatcher notifies guard personnel whenever an ambulance is dispatched from outside the Arsenal, so they can assure rapid passage through the gate.

Don't take emergency action, unless qualified and equipped to do so. Don't risk making matters worse with well-intentioned, but unqualified, responses to the emergency. You might increase hazards at the site, making it harder for responders to handle the situation. If you get injured yourself, you add to the number needing rescue or medical help.

People often do more harm than good,

with unskilled treatment of an injury or illness.

Transporting a victim without sirens and emergency lights could end in a traffic accident, especially if matters get worse on the way. Even if an ambulance left the scene later than you could, they will provide professional care on the road and reach the hospital faster.

Things you can do:

- Take emergency action, if you are qualified and authorized, and can do so safely.
- Send someone to flag down emergency personnel.
- Try to protect victims from additional injury; avoid moving them and causing further injury, if possible.
- Protect yourself.
- Take appropriate action to keep others at a safe distance from any danger.
- Keep the scene as undisturbed as possible, so we can learn from the accident investigation.
- Turn responsibility over when emergency responders arrive, helping only if directed to do so.
- Give your name and contact information to an official before leaving the scene, so you can help with the accident investigation, if needed.

Marshall

Continued from page 1

missions. As part of its Space Launch Initiative work, the Marshall Center is testing multiple engine designs using different propellant combinations, including liquid oxygen as the oxidizer and liquid hydrogen or ethanol as the fuel.

"The Marshall Center is very pleased to be testing this new technology with TRW," said Robert Champion, main propulsion/auxiliary propulsion systems project manager for the Space Launch Initiative. "Marshall has a long history of testing and developing propulsion systems for launch vehicles and spacecraft. These tests will directly contribute to advancing the next generation of propulsion systems for reusable launch vehicles."

Testing includes 30 hot-firings. This is the first engine test performed at the Marshall Center that includes Space Launch Initiative technology. The reaction control engine being tested uses liquid oxygen as an oxidizer and liquid hydrogen as fuel.

"The combination of liquid oxygen and liquid hydrogen was chosen because it offers one of the highest performances in conventional liquid engines," Champion said.

Liquid hydrogen does have its drawbacks. It must be stored at the extreme temperature of -423 F.

"By testing various fuel combinations we are able to determine which engine will best suit the requirements needed for the reusable launch vehicle," Champion said.

Another unique feature of the reaction control engine is that it operates at dual thrust modes, combining two engine functions into one engine. The engine operates at both 25 and 1,000 pounds of force, reducing overall propulsion weight and allowing vehicles to easily maneuver in space. The low level thrust of 25 pounds of force allows the vehicle to fine-point maneuver and dock. The high level thrust of 1,000 pounds of force is used for reentry, orbit transfer and course positioning.

Space Launch Initiative is a NASA-wide research and development program — managed by the Marshall Center — designed to improve safety, reliability and cost effectiveness of space travel for second-generation reusable launch vehicles. *The writer, employed by ASRI, supports the Media Relations Department.*

Center Announcements

RLV symposium April 11-12

Marshall Director Art Stephenson will address the AIAA/IAF Symposium on Future Reusable Launch Vehicles on April 11 at 8:30 a.m. Stephenson will speak on NASA's Integrated Space Transportation Plan. The event is part of the Technological Excellence in Aviation, Missiles and Space (TEAMS) Conference, April 8-12, at the Von Braun Center. For more information on the conference, go to: <http://www.hats.org/teams>

Reservations for student rocket launch due April 19

All Marshall team members are invited to Student Launch Initiative activities Saturday, April 27. High school students will be launching rockets and payloads they designed. Transportation to the launch site will be provided from the pick-up spot near the SR71 Blackbird at the U.S. Space & Rocket Center at 9:15 a.m. on launch day. Due to the limited number of people allowed in the launch area, reservations are required by April 19 and can be made by calling 544-8800.

Free tickets available for Saturday's Von Braun Forum

Free tickets are available for Marshall team members to attend Saturday's 15th annual Von Braun Forum. The event begins at 7:30 p.m. in the South Hall of the Von Braun Center. Tickets are available at the NASA Exchange Space Shop, Bldg., 4203, from 7:30 a.m. to 3 p.m. through Friday.

2002 Earth Week activities

Earth Week activities will be held April 15-19, including recycling, environmental and energy exhibits in the lobby of Bldg. 4200; a logo contest, a spot-an-environmentalist contest and a tree-planting ceremony. The theme this year is "It's Hard to Stay Green." Ceremonies are from 10-11 a.m. April 18 at the Wellness Center, Bldg. 4315.

Marshall emergency support services is S.H.E. focus

During April, the Safety, Health and Environmental focus topic is Marshall's emergency support services. To assist in raising awareness on what to do if an emergency occurs, HEMSI emergency medical technicians are available to speak at group safety meetings. To arrange for a guest speaker, call Brenda Bradford at 544-5650 or Alison Boylen at 544-5651.

Volunteers needed for United Cerebral Palsy Telethon

Marshall team members interested in volunteering for the United Cerebral Palsy Telethon on Sunday can call Tiffany Martin, event coordinator, at 852-5600 or e-mail at tmartin@ucphuntsville.org. The event is from noon to 5 p.m. at the WHNT-TV 19 studio.

Input needed for Marshall co-op student housing guide

Co-op students at the Marshall Center are putting together a housing guide. Anyone with a basement apartment or room for rent, can e-mail a description, price, location and contact information to jonathan.lowe@msfc.nasa.gov or call 544-2388. The deadline to be included in the housing guide is April 19.

Clubs and Meetings

Property management group hosting 2002 training

The Marshall Center Property Management Group is hosting the National Property Management Association Rocket City Chapter on May 21 from 8 a.m. to 4 p.m. for spring 2002 training. The training is open to all Marshall team members associated with the National Contract Management Association, National Property Management Association,

National Association of Purchasing Management or the International Facility Management Association. For more information, call Debie Grissom at 544-6572.

Spring dinner dance April 13

The MARS BALLroom Dance Club is hosting its spring dinner dance April 13 in the West Exhibit Hall of the Von Braun Center. The Buddy Chambers Combo will perform during an evening of dancing. Attire is semi-formal and tickets are \$17 for members and \$20 for guests. The evening begins with a social at 6:30 p.m. with dinner at 7 p.m. Dancing is from 8-11 p.m. For more information, call 544-0563, 544-3998 or 544-3525. For table reservations, call Woody Bombara at 650-0200.

Miscellaneous

Volunteers needed for National Youth Service Day

Volunteers age 12-24 are needed for National Youth Service Day on April 20 from 9 a.m.-noon. The project this year is to help beautify the grounds of Lincoln Elementary School by planting trees and painting. Call Ketra Rice at Big Brothers/Big Sisters of North Alabama at 880-2123 for information.

Job Announcements

No.MS02N0043

AST, Aerospace Flight Systems GS-0861-14, Systems Engineering Office, Systems Management Office. Closes April 17. Applications for promotional opportunities will not be considered for this announcement.

No.MS02N0044

AST, Aerospace Flight Systems GS-0861-14, Systems Engineering Office, Systems Management Office. Closes April 17. Applications for promotional opportunities will not be considered for this announcement.

Employee Ads

Miscellaneous

- ★ CD burner, Memorex CRW 1622 rewriteable. software: NTI CD maker and copy tools, \$25. 256-837-5782
- ★ 2001 Model mower, 4 HP, \$95; Craftsman mower, 4HP, \$25; Craftsman seeder, metal, \$10. 883-6284
- ★ Wheel Horse riding mower, 12.5HP, 37" deck, hydro-transmission, 334 hrs., \$800. 830-6584
- ★ Window treatments, pewter damask w/ revealed wedge-wood blue lining; silver leaf wooden rods/finals, new. 882-1097
- ★ Local honey, \$5 quart, \$3 pint. 837-8087
- ★ Craftsman saw, 10" radial arm, \$300. 881-3353
- ★ 1997 Longaberger holiday sleigh basket with wrought iron runners, \$85. 864-3133
- ★ Canon Elan Iie, 28-80 USB III, 75-300 USB II, 380EX, more, \$549. 256-464-8374
- ★ 1999 cal hot tub, 8-person, cover included \$1,800
- ★ Early American andirons, brass ball with eagle atop iron base, \$150 for pair. 882-1097
- ★ Class 3 trailer hitch for Blazer of Jimmy with receiver, \$50. 233-3407
- ★ Wook Karastan Rug, 8.8x12', beige w/ blues and rusts, Chinese Medallion style, \$600. 882-8684
- ★ Golfsmith junior clubs, 3, 5, 7, 9, driver, putter, bag, \$60 obo. 882-1696
- ★ Monkey grass, (liriope), solid green leaves, purplish flowers, \$1 each plant, \$75 for 100 plants. 426-4325
- ★ New Easton Z-Core BZ33 Redline Big Barrel Bat, 29 inch, 21oz., - 8 drop, 2-inch barrel, Sc500 alloy, \$135. 533-5942

- ★ 38" X 38" ft. honey oak coffee table with quad glass panels and brass trim, \$60. Call Cecelia. 883-1869
- ★ Epiphone Strat guitar w/hardcase, \$95; SDS unfired, \$195; Mac Quadra 605 system, laserwriter, extras, \$150 obo. 851-8085
- ★ Wheel Horse/Toro riding mower, 12.5 HP, 37" deck, hydro trans., 334 hrs, \$800. 830-6584
- ★ 16 foot Coleman canoe, \$300 obo, call evenings. 837-3672
- ★ Remodeling, two white 36" ceiling fans with light fixture; over range microwave, walnut color. (256) 734-8461
- ★ Utility trailer. 881-6595
- ★ Two "Cabaret" tickets, Sunday, April 7, 2 p.m., VBC Concert Hall, Centerloge, Row B. \$25 each. 881-0278
- ★ Four Dunlop tires: 255/65/R16 3/16-inch tread. \$30 each; \$100 for all. 353-5030

Vehicles

- ★ 1985 Chevy Custom van, Captain's chair and rear bench, stereo, \$3,200. 859-5624
- ★ 1998 Dodge Grand Caravan, \$9,900 obo. 233-6197/564-6225 beeper
- ★ 1992 Acura Integra GS, blue, A/T, ABS, 157K miles, \$1,750. 256-776-0024
- ★ 1995 Infiniti J30, cream color, V6, all options, 102K miles, \$8,995. 464-9232
- ★ 1988 Chevrolet Baretta, V6, auto, air, PS/PB/PW, 74K miles, \$1,595. 464-9232
- ★ 1992 Chevrolet Camaro RS, V6, purple, 105K miles, PW/PDL, cruise, AM/FM cassette, \$3,750. 931-6991
- ★ 1997 Pontiac Firebird, convertible, black, auto, all-power, CD chanber, 35K miles, \$11,500. 256-325-1490
- ★ 1996 Acura, 2.5TL, sunroof, leather, all-power, 4-door, AM/FM/CD/

- cassette, green w/tan interior. 830-0545
- ★ 1986 Honda Prelude, 189K miles, \$1,200. 881-0656 after 5 p.m.
- ★ 1999 Red Corvette Coupe, loaded, both tops, automatic, extended warranty, 19K miles, \$34,500. 325-3038
- ★ 1987 Chevy Silverado, V-8 350, 97K miles, long wheel base, camper shell, PL/PW, \$4,700. 881-8729
- ★ 1991 Buick Regal Custom, auto, a/c, 3.8L, \$2500 obo. 830-6584
- ★ 1997 Pontiac Firebird convertible, black, auto, all power, CD changer, 35K miles, \$11,500. 325-1490
- ★ 1996 Ford Windstar LS, 91K miles, non-smoker, loaded, white/gold/tan, \$7,000. 325-7542
- ★ 1989 S-15 GMC Jimmy (Gypsy Package), 4.3L, 4WD, Black/blue, 218k miles, \$1850. 837-6517
- ★ 1992 Honda Accord EX wagon, power windows, locks, sunroof, new Michelin tires, \$3500.00. 880-9487
- ★ 1996 Jeep Grand Cherokee Laredo, Alpine CD/stereo, 2 WD, Chargold, 125k miles, \$6,500. 721-0042

Wanted

- ★ First-day-issue stamps. 881-6595

Free

- ★ Children's swing set. 216-9130

Lost

- ★ B-17 Airplane tie-tac, March 25, between Bldg. 4201 and 4203 Cafeteria, gold color, gift from father. Call Tom/544-3962 if found.

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NASA

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